REPLACE CLEAR CREEK BRIDGE

AT

NATIONAL ENVIRONMENTAL EDUCATION

DEVELOPMENT CAMP

ENVIRONMENTAL ASSESSMENT

December 21, 2001

WHISKEYTOWN UNIT – WHISKEYTOWN-SHASTA-TRINITY NATIONAL RECREATION AREA
SHASTA COUNTY, CALIFORNIA

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UNITED STATES DEPARTMENT OF INTERIOR • NATIONAL PARK SERVICE • PACIFIC WEST REGION

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Introduction

Whiskeytown is a unit of the Whiskeytown-Shasta-Trinity National Recreation Area (NRA). It is located in Shasta County, California about 8 miles (13 kilometers) west of downtown Redding (See Figures 1 & 2).

The park contains about 42,500 acres (17,000 hectares) of land and water. Elevations range from 800 feet (250 meters) in lower Clear Creek below Whiskeytown Dam to over 6,200 feet (1,900 meters)atop Shasta Bally. Vegetation is a mixture of pine forest, riparian associations, and chaparral. The lake, created by an earth-filled dam on Clear Creek, has a surface area of about 3,200 acres (1,300 hectares).

Whiskeytown was established by the Act of November 8, 1965 "…to provide, for the public outdoor recreation use and enjoyment of the Whiskeytown reservoir and surrounding lands…by present and future generations and the conservation of scenic, scientific, historic and other values contribution to public enjoyment of such lands and waters…"

Whiskeytown Lake provides high quality reservoir recreation opportunities because of its forested mountain setting, and its lake-like appearance due to a mode of operation that keeps the reservoir full throughout the summer months.

The park has an average visitation of about 750,000 visitors per year. Visitation levels can soar in dry years when other nearby reservoirs are severely drawn down.

The Bureau of Reclamation manages the power and water supply functions of Whiskeytown dam and reservoir.

The proposed project is located on Clear Creek, about one mile below the dam at an elevation of about 840 feet (280 meters).

A. Purpose and Need

The existing bridge over Clear Creek provides access to the National Environmental Education Development (NEED) Camp. The NEED camp is operated by the Shasta County Office of Education in cooperation with staff from the Whiskeytown Unit of the Whiskeytown-Shasta-Trinity National Recreation Area. and provides overnight and day environmental education programs for approximately 4,000 students per year. The bridge provides the main vehicle access to the Camp for students, teachers, staff as well as deliveries of food and fuel for the kitchen.

The single lane, 18 meter (60-foot) long by 3.6 meter (12-feet) wide bridge consists of two concrete abutment walls at each end of the bridge and two intermediate concrete piers located mid channel in Clear Creek. The superstructure of the bridge consists of three six meter (20-foot) long spans comprised of wood girders supporting a wood deck that is surfaced with a thin layer of asphalt paving. The railings on the bridge are also constructed of wood. When the bridge was constructed in 1970, the Park staff did not have the benefit of any hydrologic data on what size opening under the bridge would be required to accommodate flood flows. Therefore when high flood flows occur, the opening under the bridge is not adequate to pass the large volume of water and the water backs up behind the bridge, and then spills over the roadway on each end of the bridge. This water spilling over the roadways has repeatedly washed out the approaches in 1974, 1983, 1997, and 1998. When these washouts occur, the bridge is closed to traffic until repairs can be made. Up to 1,500 m^3 (2,000 cubic yards) of soil and pavement are washed away and into Clear Creek and the downstream Sacramento River system during each of these flood events. The costs to repair these washouts have been as much as $250,000 each and have required one to two months to repair and reopen the road. These washouts also diminish the value of salmonid spawning beds in Clear Creek.

Although bedrock is shallow or exposed in the vicinity of the bridge, the eastern most pier and east abutment wall are not founded on solid rock, but were built on soil that lies on top of the bedrock. During previous flooding the westerly pier was undermined (scoured) and the bridge settled two feet. The top of the pier was extended to restore the bridge deck. Over time the creek flows have eroded cavities in the soil under the east pier and abutment wall. In periods of high water flow, the eroded soil cavity could easily be enlarged to the point where all or part of the pier or abutment could settle or collapse, thus in turn causing the bridge to settle or collapse.

Due to the erosion under the east abutment and pier, the Federal Highway Administration (FHWA) estimates the remaining life of this structure to be three years. Because of inadequate hydraulic performance and scour susceptibility, they recommend replacing the bridge. In addition they recommend monitoring the structure during and immediately after major flood events for signs of scour around the easterly pier and abutment. The FHWA has placed load limits on the bridge and rated the bridge as “critically deficient, but can remain in service at reduced loads with frequent inspections”.

Average daily traffic on the bridge and roadway is approximately 30 vehicles per day. Although the amount of traffic on the bridge is low enough that the single lane width is adequate, the lack of a sidewalk does force the many school groups from the NEED Camp to walk in the traffic lane when crossing the bridge (as many as 150 children per week). No motor vehicle or pedestrian accidents have ever been recorded on the bridge.

B. Alternatives

B.1 No Action (Maintain Existing Bridge)

Under this alternative the bridge would not be removed and there would be no replacement bridge built. The existing bridge was rated as critically deficient by the Federal Highways Inspectors in June 1999, but was allowed to remain in service with frequent inspections. The bridge is hydraulically deficient due to inadequate bridge opening and because the easterly pier and abutment footing are founded in scour susceptible material. As a short-term measure, the bridge is inspected after major flood events for signs of scour around the pier or abutment.

B.2 Preferred Action Alternative (Replace Existing Bridge)

Under this alternative, the existing single lane vehicular bridge would be replaced with a new single lane vehicular bridge that will be able to pass a 100-year flood without impeding the flow of Clear Creek (See Figures 3, 4, & 5). The new bridge would be approximately 16 meters (50-feet) upstream (north), and parallel to the existing bridge (see Figure 1). The new bridge would be 78 meters (260 feet) long (60 meters longer than the existing bridge) and constructed with two 39-meter (130-foot) long spans. In the center a single concrete pier, founded on the shallow bedrock would support each of the spans. The pier would be on the east bank outside of the present low water creek channel, in riparian habitat. Each of the new spans would be comprised of precast concrete girders supporting a poured in place concrete deck. The 6.6-meter (22-foot) wide deck would support a 4.3-meter (14-foot) wide vehicle lane, a 1.5 meter (5-foot) wide sidewalk, and railings on each side. Each abutment would be constructed on earthen approach road fill with piers that would extend down through the fill to the bedrock below. The end of the approach road fills surrounding the abutment would be armored with riprap rock bank protection to prevent erosion of the bridge during flood events. Approximately 60 linear meters (200 linear feet) of roadway would need to be constructed on each end of the new bridge to connect the existing road to the new bridge (400 linear feet total). The fill slopes of the approach road would have 2:1 (horizontal to vertical ratio) slopes to facilitate revegetation and be more stable over time. On the west approach, a low (1.2 meters high), 20 meter (65 feet) long concrete retaining wall would be constructed parallel to Clear Creek. This wall would keep the toe of the abutment fill from extending into the present channel of Clear Creek. The western abutment is outside of the low flow portion of the channel but would be built in a wetland about 1,190 meters^2 (12,809 square feet).

The approach road, as the present road, would be paved with asphalt. Traffic on the one lane and one way bridge would be controlled. All traffic would be required to stop before crossing the bridge. The bridge and approach roads have been designed to allow sufficient sight distance to see any on coming vehicles on the bridge. Where the new approach road intersects the existing road, a one to two car paved parking pullout would be provided on each end of the bridge for park visitors. Additional parking is available on the east side (about10 spaces) near the intersection with Paige Bar Road, and on the West side in the NEED camp overflow parking area (about 30-40 spaces).

The entire length of the project (bridge and new approaches) is about 318 meters (about 1,043 feet). The new disturbance area for the west and east abutments are about 1,800 meters^2 (19,400 square feet) and 2,600 meters^2 (28,000 square feet) respectively.

The existing bridge including all of the approach road fills would be removed from the old

streambed. The area would be replanted with native riparian species (willow, alder, cottonwood, etc). The area of the former bridge and approach road fill that would be restored to native riparian vegetation would be about 1,245 square meters (13,400 square feet, See Figure 6).

B.2.1 Construction Phasing

The project would be constructed in eight phases: 1) Clearing and grubbing; 2) Bridge foundation construction; 3) abutment construction; 4) bridge construction; 5) approach road fill and roadbed construction; 6) old approach road fill removal; 7) revegetation and, 8) old bridge demolition and removal.

Clearing and grubbing: A temporary construction limit fence would first be installed around the project perimeter to prevent inadvertent damage to soils and vegetation outside the project. Then woody vegetation and roots within the areas to be filled or excavated and within the construction limits would be removed.

Bridge Foundation Construction: The bridge would be supported with a large pier (approximately 2.5 meters by six meters in area) at mid-span with spread footing abutments on the east and west ends of the bridge. The low retaining wall on the west abutment would also be constructed at this time. Access to these excavation sites would be via existing disturbed trails and roads. To avoid impacts to threatened anadromous fish (Steelhead trout and spring run Chinook salmon) all near stream construction activities would be restricted to June, July, and August: when spring-run Chinook salmon would not be present in the vicinity of the bridge. A one to two meter deep excavation through the sand and gravel and into the bedrock would be required for the foundation of the center pier on the east bank of the creek. To keep this excavation relatively free of ground water during the building of forms and pouring concrete, a cofferdam would be placed around the excavation. Ground water that leaks into the excavation would be pumped out of the cofferdam. The turbid water from the excavated foundation site would be pumped upslope and away from the creek and dispersed onto the ground to slowly percolate back into the soil. No turbid water would be allowed to run back directly into the creek. Any ground water encountered while excavating for the east and west abutments and west retaining wall would be treated in the same manner.

Abutment Construction: Immediately following the construction of the pier and abutments footings, the abutment fills would be constructed. This would require clearing the existing vegetation within the abutment area, salvaging and stockpiling the topmost six inches of soil (150 millimeters) for reuse in revegetation and placement on top of imported fill dirt. The most likely source of the fill would be several existing soil stockpiles within Whiskeytown NRA. If the existing stockpiles are not adequate, fill would be imported from outside the Park. All sides of the fills would be graded with a 2:1 slope (horizontal to vertical ratio) and then covered with the salvaged topsoil. The existing surface soil contains seeds and microorganisms that if reapplied to the surfaces of the new earthwork, greatly enhancing the vegetation recovery. To protect the creek from any soil erosion of the new soil fill prior to the establishment of a stabilizing vegetative cover, a silt fence would be installed to around the edge of the new fill. On the ends of each approach road fill, around the bridge abutments, the slopes would be covered with an approximately one meter thick layer of rock riprap.

Bridge Construction: The proposed single-lane bridge would have 2 spans, comprised of three precast concrete girders in each span. The girders would be cast in an off site facil-

ity and hauled to the work site by truck, and then placed on the pier and abutments with a large truck crane. Following the placement of the girders, forms would be placed between the girders and the concrete deck of the bridge would be poured and finished, and after a period of time to allow the concrete deck to cure, guardrails would be bolted into place. At this time the aggregate base and asphalt paving would also be placed on the approach roads. The bridge would open to public traffic by the end of October 2002. To connect the new approach roads with the existing roadway, some short, and temporary traffic closures likely would be required. Most likely would be less than one day in duration, and throughout this time it would be possible to maintain pedestrian access for school groups and staff, though the walking surface might not be suitable for disabled students or staff as some rough ground may be encountered.

Approach Road Fill and Roadbed Construction: To keep the old roadway open to traffic, the approach road fills and roadbed would most likely be constructed after most of the bridge was constructed. This would require salvaging and stockpiling the topmost 150 millimeters of soil (six inches) for reuse in revegetation and placement of imported fill dirt. The most likely source of the fill would be several existing soil stockpiles within Whiskeytown NRA. If the existing stockpiles are not adequate, fill would be imported from outside the Park. All sides of the fills would be graded with a 2:1 slope and then covered with the salvaged topsoil. The surface soil contains seeds and microorganisms that if reapplied to the surfaces of the new earthwork, greatly enhancing the vegetation recovery. To protect the creek from any soil erosion of the new soil fill prior to the establishment of a stabilizing vegetative cover, a silt fence would be installed around the edge of the new fill. Due to the significant grade differential between the existing and proposed roadway, temporary grading between the two may be required to allow vehicles to traverse from one to the other.

Up to one-foot of earth would be removed from the approximate 750 meter^2 (8,000 square foot) area downstream of the eastern approach road. The origin of most of this material is the results of previous flooding and the subsequent depositing of the eroded bridge approach. This removed material would be used as a portion of the fill for the new eastern abutment. Removing this material will promote a return to a more natural hydrologic condition of the riverian system and allow for possible channel migration.

Revegetation: Following the completion of the earthen approach road fills, and the excavation and removal of the old approach road fills in the fall 2002, these areas would be replanted with locally propagated native shrubs, trees, grasses, and groundcovers of the same species that were removed. About 1,500 plants would be planted in a 1.04-acre area. Following planting, slopes and disturbed soils would be covered with protective certified weed-free mulch and native grass seed, spread by hand as appropriate to further to further reduce potential soil erosion. The seeds and cuttings of native plants from the locality of the bridge are being collected and propagated. Local site adapted plant materials would be ready to plant on the site as construction stages allow in the fall or early winter of 2002 and 2003. A narrow access lane on the east bank of the creek would be left without tree and shrub planting so that heavy equipment could access the old bridge concrete abutments and piers during the next summer (2003) low water season and demolish and remove these structures. A second phase of revegetation would occur in the fall 2003 and the access road would be decompacted prior to planting. The silt fences and other erosion sediment control measures that would be monitored and maintained throughout the first winter so as to insure that sediments do not enter the creek before a stable vegetative cover is established. Exotic plant infestation will be monitored and herbicide application will be used on site to control exotic weeds and/or non-native plants that could enter the construction site.

Old Bridge Abutment and Pier Demolition and Removal: In the summer low water season (June, July and August) 2003, heavy equipment would use the unplanted access corridor and demolish and removal the old concrete bridge abutment walls and piers. The piers and walls would be surrounded with netting and or other materials to catch concrete debris as the structures are broken up to a size that can be lifted out of the creek. Small coffer dams of sandbags, plastic sheeting, and other barrier material would be used to separate the clean stream water from the site when the piers are removed from the creek. As previously described, silty water from these excavations would first be pumped to an upland location for percolation back into the ground. All debris and footings would be removed from the creek and the Park. Heavy equipment would work from the roadway, new bridge or both banks of the creek to remove the piers and abutments from the stream. Heavy equipment would not cross the creek. If any depressions or excavations remain in the creek channel after the pier removal, they would be filled with clean, washed gravels to facilitate spawning by anadromous fish. The access corridor would then be decompacted, seeded, planted and mulched so that vegetation would reclaim the former riparian area alongside the creek.

General: Construction and erosion control Best Management Practices (BMP's) would be employed. The entire work site would be fenced with a temporary fence to prevent inadvertent impacts to the surrounding vegetation and landscape by heavy equipment. The contractor would not be allowed to build temporary river crossings that involve placing material in Clear Creek, or allow equipment, heavy or other types, in the creek. At the end of the project, all construction access routes and other routes that have allowed vehicles to drive into the wetlands alongside the creek would be closed and blocked to allow revegetation and recovery of the wetland vegetation. A roadbed from the new eastern abutment to the old eastern abutment would be maintained until the abutments and piers are removed. After demolition is completed this roadbed would be decompacted and revegetated. Prior to this demolition this roadbed would be seeded with native grasses to reduce erosion. Equipment refueling and maintenance would occur outside the stream channel and the flood plain. The contractor would have spill containment and clean-up equipment on site. A Federal Highway Administration inspector would be on-site throughout the project duration to assure contractor compliance with resource protection measures.

B.3 Other Alternatives We Considered But Rejected

Two other alternatives initially discussed were replacing the bridge with a ford or moving the bridge to a narrower portion of the canyon. The former alternative was rejected because of this crossing would be frequently impassable in the winter due to high water when the NEED camp gets its highest use. The latter alternative would utilize the Peltier Bridge crossing approximately 1 kilometer (0.6 mile) upstream of the existing bridge and include realigning, widening and paving approximately 3.25 kilometers (2 miles) of connecting roads between Paige Bar Road and the NEED Camp. This alternative was rejected because of the environmental damage and higher costs that would result from realigning, widening and paving the connecting approach roads. This access route would also bring traffic to the NEED camp through the heart of the camp and thus would also create traffic conflicts with pedestrians and camp operations as well as cross through the newly restored Paige Bar watershed, and the nearby sensitive significant Native American cultural area. Therefore this alternative was dropped from further consideration.

C. Affected Environment

C.1 Visitor Use

NEED camp is operated cooperatively by the Park and by Shasta County Office of Education and is used by about 4,000 students per year or up to 150 elementary aged children each week from September through June. The camp has operated for over 30 years and is the principal environmental education facility in Sacramento Valley. Various other civic and youth groups also use the camp on weekends and during the summer. When the bridge is damaged or is made inaccessible the camp is isolated except for the dirt trail that is used for emergency vehicular access and foot traffic.

School busses with fifth and sixth grade students cross the bridge several times each week during the school year. Other vehicles crossing the creek on the bridge include Shasta County School staff, delivery trucks carrying food and other supplies, staff vehicles, garbage trucks and NPS and private vehicles. The bridge is also used extensively by pedestrians.

C.2 Public Safety

The bridge center piers have been determined to be susceptible to being undermined from flooding. If the piers are undermine the entire bridge may be swept away by the flooding waters. During periods of flooding the NPS closes the bridge to all vehicle and pedestrian traffic.

C.3 Operations

NPS personnel and their vehicles also use the bridge to have access to the NEED camp and other areas on the west side of Clear Creek. Resource protection, resource management, administrative purposes, law enforcement, road and building maintenance, and fire management are some of the reasons NPS would access the west side of the creek. NPS vehicles include patrol cars, fire engines, heavy equipment such as road graders, front-end loaders etc.

C.4 Wildlife and Vegetation

Wildlife. The Whiskeytown Unit has abundant and diverse wildlife; visitors hunt black bear, black-tailed deer, grey squirrel, feral pig, wild turkey, California quail, mountain quail, mourning dove, and band-tailed pigeon. Other mammals in the Unit include mountain lion, ringtail cat, raccoon, gray fox, bobcat, and coyote.

Vegetation. The park contains about 16,000 hectares (39,000 acres) of upland habitat (mostly mixed conifer forest, oak woodland, and chaparral) The wetland habitats include a 1,300 hectare (3,200 acre) lake and less than about 80 hectares (200 acres) of stream side (wetland) vegetation along the parks many small streams.

The park has numerous species of exotic plants such as star thistle, locust, Himalayan blackberry and scotch broom. The park is concentrating exotic plant removal efforts in the vicinity of the current bridge to eliminate as much seed spread as possible.

The vegetation near the NEED camp includes the common plant species listed in Tables 1 and 2.

Table 1. Wetland Plant Species

Alder — *Alnus rhombifolia*	Locust — *Robinia pseudoacacia*
Sagebrush – *Artemisia douglasiana*	Narrow-leaf willow — *Salix exigua*
Sedges — *Carex spp.*	Willow — *S. laevigata*
Buttonbush – *Cephalanthus occidentalis*	Arroyo willow — *S. lasiolepis*
Darmera peltata	Spieaea — *Spirea douglasii*
Scouring Rush — *Equisetum arvense*	Cattail — *Typha domingensis*
Black Cottonwood — *Populus balsamifera*	

Table 2. Upland Plant Species

Eldorado Manzanita – *Arctostaphylos viscida*	
Gray Pine – *P. sabiniana*	
Milkweed – *Asclepias fascicularis*	Plantain — *Plantago spp.*
Canchalagua — *Centaurium vensutum*	Black oak — *Quercus kelloggii*
Bull thistle – *Cirsium vulgare*	Blackberry — *Rubus discolor*
Toyon – *Heteromeles arbutifolia*	White clover – *Trifolium Repens*
Monkey-Flower — *Mimulus cardinalis*	Moth mullein – *Verbascum blattaria*
Knobcone Pine— Pinus attenuata	Common mullein – *Verbascum thapsus*
Black Oak — Quercus kelloggii	Blue Oak - - Quercus douglasii
Ponderosa Pine — *P. ponderosa*	Wild Grape — *Vitis californica*

C.5 Threatened and Endangered Species

The Endangered Species Act requires in part, that the federal government identify, protect, and institute programs to promote the recovery of threatened and endangered species. An endangered species is one in danger of extinction throughout all or a significant portion of it range. A threatened species is one likely to become endangered within the foreseeable future.

Salmonids. A major improvement to the area's fisheries occurred in October 2000 with the removal of the 90 year old Saeltzer-McCormick Dam on Clear Creek. This dam, located about 12 kilometers (7. 5 miles) downstream from the Clear Creek Bridge blocked access to more than eight miles of potential spawning and rearing habitat for threatened Chinook salmon and steelhead trout. Its removal allows anadromous fish to access all portions of Clear Creek below Whiskeytown Dam. Stream restoration work completed in the middle section of Clear Creek is intended to improve spring-run salmon and steelhead habitat.

The populations are the fall, late fall, and spring runs of Chinook salmon and the winter Steelhead are using or have historically used and, with the removal of Saeltzer-McCormick dam, are expected to repatriate Clear Creek and use it has a spawning area. Fish are in the stream year-round. (A "run" is salmon race named after the time of year when they enter fresh water. Typically different runs use different portions of the stream and spawn at different times of the year).

Salmonid species need clean water and gravel for their spawning. Female fish will dig a

depression in the gravel steam bed and deposit her eggs in this depression. During this process, attending male will fertilize the eggs while the female loosens gravel immediately upstream. Currents will carry this gravel downstream and cover the now fertilized eggs. The eggs will remain in these depressions for a period of weeks or months depending upon water temperature. After hatching, the fry continue to live in the gravel, then, eventually, wiggle through the gravel to the surface, where they emerge to begin their lives as free-swimming fish (Kondolf, G. Mathias. 2001).

If the gravel is contaminated, from the silts from upstream erosion (such as bridge abutment washouts and piling placement or removal) will negatively impact habitat and reproduction of threatened and endangered salmon and steelhead trout. In addition to the NPS directives on resource protection and requirements under the Endangered Species Act, Whiskeytown participates in the Lower Clear Creek Coordinated Resource Planning group. This group's goal is to improve habitat, especially for salmonids.

Wildlife. The NRA has two resident federally threatened wildlife species, the northern bald eagle and the northern spotted owl. The bald eagle and the northern spotted owl both have successful fledging records in the Whiskeytown Unit.

Whiskeytown NRA has had two nesting pairs of bald eagles. Bald eagles are regularly observed near Whiskeytown Lake and are occasionally seen fishing along Clear Creek south of Whiskeytown Dam. One pair typically has typically nested in the lower Clear Creek watershed, about two miles from the project site, however no nesting has occurred since 1998. The other pair nest within about three miles of the project site. In the unlikely event that bald eagles nest within the project area the park would immediately contact the U.S. Fish and Wildlife Service for advice on how to proceed.

No suitable spotted owl habitat exists within several miles of the NEED Camp Bridge and no spotted owl activity centers have been located in the lower Clear Creek watershed.

Additionally, lower Clear Creek is potential habitat for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) although there are no documented sightings. Elderberry (*Sambucus mexicana*) are a necessary habitat component for the beetle. Elderberry shrubs are not known to occur within the park. A recent survey within the project site found no elderberry shrubs present.

C.5.1 Other Sensitive Species

Plants. None of the 16 known plant species of special concern (threatened, endangered, candidate, or sensitive species) found in Whiskeytown NRA are believed to occur in the area of the NEED Camp Bridge (Gretchen Ring, NPS botanist, personal communications, March 7, 2001). Two botanical surveys have been conducted in the project area.

The Clear Creek area contains habitat that is apparently suitable for the State of California listed willow flycatcher. Observations of the willow flycatcher have not been made in the project area.

C.6 Cultural Resources

The NEED Camp area has been inspected for historic and prehistoric archeological resources several times for compliance purposes; several formal Archeological Clearances have been issued for projects within this area. An archeological site within the grounds of the NEED Camp (CA_SHA-177) has been determined eligible to the National Register of Historic Places. The immediate proposed bridge replacement area was inspected in June 1997 by profes-

sional NPS archeologists who did not locate archeological resources within the bridge abutment vicinity. However, total bridge replacement was not considered at that time. Therefore, an additional survey will require expanded coverage; but it is not believed that the area of potential effect (APE) is archeologically sensitive. The 1997 clearance report recommended visible barriers for the APE boundary nearest to CA-SHA-177. This action was discussed on June 25, 1997 with local WINTU representatives who have interest in conserving known archeological resources at the NEED Camp location and their use of the facility (see Emberson 1999).

The 1997 survey will be updated to verify that cultural resources would not be impacted by the proposed action. This survey shall be conducted concurrently with the public review of this environmental assessment. If cultural resources are found, the State Historic Preservation Office will be consulted to determine appropriate treatments before proceeding with the project.

D. Environmental Consequences

Methodology. Potential impacts were analyzed for their context, intensity, and duration. The definitions of impact terms used in this section are:

Negligible: The impact is at the lower levels of detection.

Minor: The impact is slight, but detectable.

Moderate: The impact is readily apparent.

Major: The impact is severely adverse or exceptionally beneficial.

Non-impairment. No action is allowed to "impair" national park resources or values, according to the NPS Organic Act of 1916 and NPS Director's Order #55. An action could have some impact, even a measurable or significant impact, but "impairment" is strictly prohibited. This project, under either alternative, would have temporary, small scale, site specific impacts (e.g., dust, safety) but would not impair national park resources or values on a long-term or large scale.

D.1 No Action Alternative

Maintain existing bridge, continue to restrict natural channel width with in stream pier abutments and road approaches.

D.1.1 Visitor Use

Flooding would continue to occasionally close and washout the bridge access to NEED Camp. When the NEED Camp bridge is inaccessible, visitors, students, staff, and park employees ingress/egress would be via foot through the washout and over the creek.

During infrequent periods when bridge or its approaches are washed out emergency vehicle access would be lost. Without emergency vehicle access and response camp staff and visitors and the camp facilities would be at a slightly higher risk.

Implementation of the no action alternative would result in minor impacts to the visitor's use of the park. Frequent flooding and subsequent bridge washouts would result in the NEED camp's students and staff suffering moderate impacts.

D.1.2 Threatened and Endangered Species

During high-water events, erosion of bridge approaches would continue to diminish quality of salmonid spawning habitat. Should the fresh water eel repatriate Clear Creek, future erosion of the bridge approach would diminish the quality of its potential spawning habitat as well. Up to 1,500 meters^3 (2,000 cubic yards) of soil and pavement are released into the creek with each washout event. No other threatened or endangered species is anticipated to be impacted by this alternative.

Implementation of this alternative would result in a negative impact to park species and would be considered as an impairment to park resources.

D.1.3 Wildlife and Vegetation

Wildlife. With future flooding the existing bridge approach would continue to erode and accrete its fill on wetland habitat resulting in a continual loss, although incremental, of that habitat. It is estimated that the four previous bridge washouts have deposited about 750 meters^3 (8,000 cubic feet) of material downstream of the bridge's approach). Material washed out from the existing bridge's eastern approach during flooding would continue to be deposited downstream. This washed out material is observed immediately downstream of the approach and has resulted in the wetland community being replaced by an upland community. The existing approach and downstream material are subject to future flooding and erosion resulting in temporary, short-term habitats and unstable animal populations in the small area impacted.

The park's wildlife and vegetation would not be impaired by the implementation of this alternative.

Vegetation. The No Action alternative would result in continued destruction of wetland plants during high water events. In addition the size of the park's wetland habitats would continue to shrink. Material washed out from the existing bridge's eastern approach would continue to be deposited downstream. This washed out material is observed immediately downstream of the approach and has resulted in the wetland community being replaced by an upland plant community. The existing approach and downstream material are subject to future flooding and erosion. Plant communities will remain unstable.

D.1.4 Cultural Resources

The No-Action alternative would not impact any cultural resources. The park's cultural resources would not be impaired by this project.

D.1.5 Operations

Future bridge washouts are anticipated. During these flood events there would be no vehicle access to the west side of the bridge. Park operations and emergency services would be disrupted resulting in increased costs in arranging out methods of access (e.g. helicopter, portable bridges). This impact is considered as moderate.

D.1.6 Cumulative Impacts

With the retention of the old bridge and its propensity to washout and deposit its sediments downstream, implementation of this alternative would work against other agencies actions to restore Clear Creek's salmonid fisheries. These improvements include the removal of Saeltzer-McCormick Dam and a Bureau of Reclamation project that is depositing gravel into Clear Creek to improve salmonid spawning habitat. More gravel deposits are expected in the future. This alternative would tend to counter the positive cumulative impacts that have, or are planned to occur, to the Clear Creek salmonid fisheries.

D.2 Proposed Action Alternative

The proposed Action Alternative, construct a new bridge immediately upstream of the existing structure, is considered the "environmentally preferred" alternative. This reasoning is based on the fact the new bridge would allow the park to remove the old bridge's in stream structure and its associated road approaches. This would restore the channel closer to natural conditions and reduce damage to the park's natural resources during flood events (wash out of existing bridge approaches to down stream salmon habitat).

D.2.1 Visitor Use

Disruption to visitor access to NEED Camp and safety risks would be eliminated. The new bridge would all legal support vehicle loads allowing access for all the delivery and emergency vehicles that would be expected to need access to the camp. During bridge construction, visitor access may be delayed by construction activity. Any road closures would be less than one day and would be scheduled in advance with the NEED Camp so that deliveries and school groups would encounter minimum inconvenience.

Implementation of this alternative would result in minor temporary construction impacts to visitor's use of the park.

D.2.2 Threatened and Endangered Species

The new bridge would stop periodic washouts that have contributed sediment to the creek and diminish streambed habitat. Streambed quality would be expected to improve with this alternative.

To avoid impacting federally listed fish construction and demolition would coincide with a three-month window (June, July, and August). This window is when spawning is not occurring and only a small portion of the adult population are present in Clear Creek (work on the approach road and eastern abutment would occur outside of this window). During the entire construction period there would be no work occurring within the streambed. Demolition would occur during the three-month window. Netting would be installed under the old bridge's superstructure to catch debris during its removal. The concrete piers and abutments would be dragged out of position and hauled off site. Releases from the Whiskeytown dam would temporarily be increased. This increased stream flow would dilute the sediments resulting from the pier and abutment removal. Clean gravel, suitable for fish spawning would be fill the voids created when the pier and abutments are removed. No negative impacts are anticipated to sensitive wildlife species.

The nesting bald eagles are outside of the project area and would not be impacted by the proposed activities. The bald eagles that occasionally feed in the area are would not be

impacted from the proposed project activities.

There would be no affect on federally listed species or designated critical habitat from the proposed project activities. Implementation of this alternative would result in an expected positive impact to the park's sensitive species and no park resources would be impaired.

D.2.3 Wildlife and Vegetation

To reduce introduction of new exotic species or the spread of exotic species already found within the park all equipment used during construction would be washed prior to entering the park.

About 4,300 meter^2 (46,500 square feet) of upland habitat would be disturbed (See figure 6). This proposed project would result in a permanent loss of about 550 meters^3 (6,000 square feet) of upland habitat. Wildlife associated with this habitat, would be displaced to adjacent undisturbed areas or, the more likely result, animals would not survive. Because it is a very small area disturbed and because of abundant upland habitat in the region and immediate area this impact is anticipated to be minor. This proposed project would remove fill that has covered historic wetlands and is responsible for blocking seasonal flows from a downstream area and changing it, an historical wetland, into habitat characteristic of upland habitat. This proposed project would result in a net gain of about 950 meters^3 10,200 square feet of wetland habitat.

The approximate 750-meter^2 (8,000) area downstream of the eastern approach would be expected to change from its disturbed, upland type of vegetation to wetland vegetation with the removal of the old eastern approach. The eastern approach is acting as a jetty, diverting high flows from the pre-fill river course. Thus the approach is shielding this area from receiving its historically seasonal flows of water and it is believed to be the reason why this downstream area appears to be more upland-like in its vegetation character than the area immediately upstream. With the removal of the approach, the vegetation downstream is assumed would eventually be replace by wetland vegetation similar to what occurs upstream of the approach. The downstream area would be replanted with wetlands species.

Exotic plant infestation will be monitored and herbicide application will be used on site to control exotic weeds and/or non-native plants that could enter the construction site.

About 1,500-meter^2 (16,150 square feet) of upland habitat at the eastern abutment would be disturbed. This area would be covered with fill material, similar to the existing soils, recontoured to a 2:1 slope, and replanted with native vegetation. There would be a short-term (up to 5 years) loss of mature upland habitat while the disturbed area recovers.

The federally listed Valley elderberry longhorn beetle, gray vireo, and willow flycatcher are not presently found in the project area. These species prefer wetland habitat. Increasing the amount of wetland habitat increases the likelihood that these species would occupy this habitat in the future.

The new western abutment would remove about 1,200-meter^2 (12,800 square feet) of wetland habitat. The removal of the old western abutment would allow about 400-meter^2 (4,500 square feet) of wetland vegetation to be restored.

About 830-meter^2 (8,900 square feet) of land would be exposed under the old eastern abutment and approach road. This area would be replanted and restored with native wetland species.

The following tables summarize the impacts to habitats in the project area. These tables identifies the area, provides total area disturbed, area temporarily (area disturbed by construction or demolition activities and would return as fully functional habitat) and permanently (area lost as this type of habitat), areas restored to a specific type of habitat, and net gain or loss of wetland or upland habitats.

Table 3. Wetland [in Square Feet (acres)]

Area (see Figure ?)	Disturbed	Temporary Loss of Wetlands	Permanent Loss of Wetland	Restored	Net Wetland Gain/Loss
Area 1	12,800 (0.29)	0	12,800	0	-12,800
Area 2	2,900 (0.07)	2,900	1,410	1,490 (0.03)	1,490
Area 3	250	0	250	0	-250
Area 4	300	300	0	0	0
Area A	0	0	0	4,500 (0.1)	4,500
Area B	0	0	0	9,000 (0.21)	9,000
Area C	0	0	0	8,000 (0.18)	8,000
East Abutment	0	0	0	0	0
Totals	15,700 (0.36)	3,200 (0.07)	14,460 (0.3)	22,990 (0.53)	+9,940 (0.23)

Table 4 Upland Vegetation [in Square Feet (acres)]

Area	Disturbed	Temporary Upland Loss	Permanent Upland Loss	Restored	Upland Net Gain/Loss
Area 1	0	0	0	12,800(0.29)	12,800
Area 2	0	0	0	0	0
Area 3	0	0	0	0	0
Area 4	0	0	0	0	0
Area A	1,490* (0.03)	0	1,490	0	-1,490
Area B	9,000 (0.23)	1,100 (0.03)	9,000	0	-9,000
Area C	8,000 (0.18)	0	8,000	0	-8,000
East Abutment	28,000 (0.37)	27,850 (0.37)	150	27,850	-150
Totals	46,490 (1.07)	28,950 (0.66)	18,640 (0.43)	40,650 (0.93)	-5,840 (0.13)

* Road and its fill removed and restored as wetland.

In summary, this alternative would result in a net loss of about 540 meter^2 (5,800 square feet) of upland vegetation habitat and a net increase of about 920 meter^2 (9,900 square feet) of wetland habit. Implementation of this alternative would result in an expected positive impact to the park's wildlife and vegetation and park resources would be minimally impacted but not impaired.

D.2.4 Cultural Resources

An archeological survey, completed in December 18, 2001, confirmed an earlier NPS assessment that no cultural resources are present in the proposed project site and that no impacts are expected to occur (negative finding). All Section 106 actions shall be completed before a "Finding of no Significant Impact" (FONSI) statement is signed.

The park's cultural resources would not be impaired by this project.

D.2.5 Operations

Less bridge failures would allow fewer interruptions for safety and maintenance staff and vehicles to service the NEED camp's daily management.

Access to NEED camp would be difficult for a period of 1-3 weeks during a portion of the time that bridge construction and demolition is occurring. This is considered to be minor impact.

D.2.6 Cumulative Impacts

No negative cumulative impacts have been identified. However, it is believed that the removal of Saeltzer-McCormick Dam, the Bureau of Reclamation's deposition of gravel into Clear Creek to provide improvements to spawning habitat, and this proposed bridge removal/replacement project would have positive cumulative impacts to the Clear Creek salmonid fisheries.

D.2.7 Wetlands

This project would result in an increase of about 10,000 square feet (0.23 acre) of wetland habitat and an improved salmonid habitat.

E. Consultation and Coordination

Gordon Reetz, biologist from the Pacific West Regional office with advice and consultation from the NPS management and staff listed below prepared this document.

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Jennifer Gibson	Ecologist, WHIS
Russ Weatherbee	Wildlife Biologist, WHIS
Gretchen Ring	Botanist, WHIS
Jerry Wheeler	Facility Manager, WHIS
Wayne Pero	Maintenance Mechanic Foreman
Brian Rassmussen	Geologist, WHIS
Robbyn Jackson	Historical Architect, PWR
Roger Kelly	Regional Archeologist, PWR
Dave Kruse	Landscape Architect, PWR
Will Ness	Army Corps of Engineers, Sacramento
Scott Zaitz	California Regional Water Quality Control Board, Redding
Jess Newton	U.S. Fish and Wildlife Service, Sacramento
Sam Holder	Federal Highway Administration, Denver
William Jones	Federal Highway Administration, Denver
Rick Simansons	Federal Highway Administration, Denver
Howard Brown	National Marine Fisheries Service
Mike Tucker	National Marine Fisheries Service

This document will be available to the public and comments will be accepted for 30 days. After receiving and evaluating public comments if the Superintendent finds that the proposed action will not significantly affect the quality of the human environment a Finding of No Significant Impact (FONSI) will be prepared and forwarded to the Pacific West Regional Director for his approval.

F. References

Cowardin, L. M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. NOAA, Wash. D.C. ,

Emberson, G.D. (with D. Theodoratus). 1999. Ethnographic Overview and Traditional Use Study of American Indians Affiliations within the Whiskeytown National Recreation Area, California.

G. Mathias Kondolf, 2001. 202 Wurster Hall, University of California, Berkeley CA 94720-2000. kondolf@uclink.berkeley.edu

Ring, Gretchen, NPS botanist. March 7, 2001. Personal communications. National Park Service, Whiskeytown NRA, Whiskeytown, CA 96095

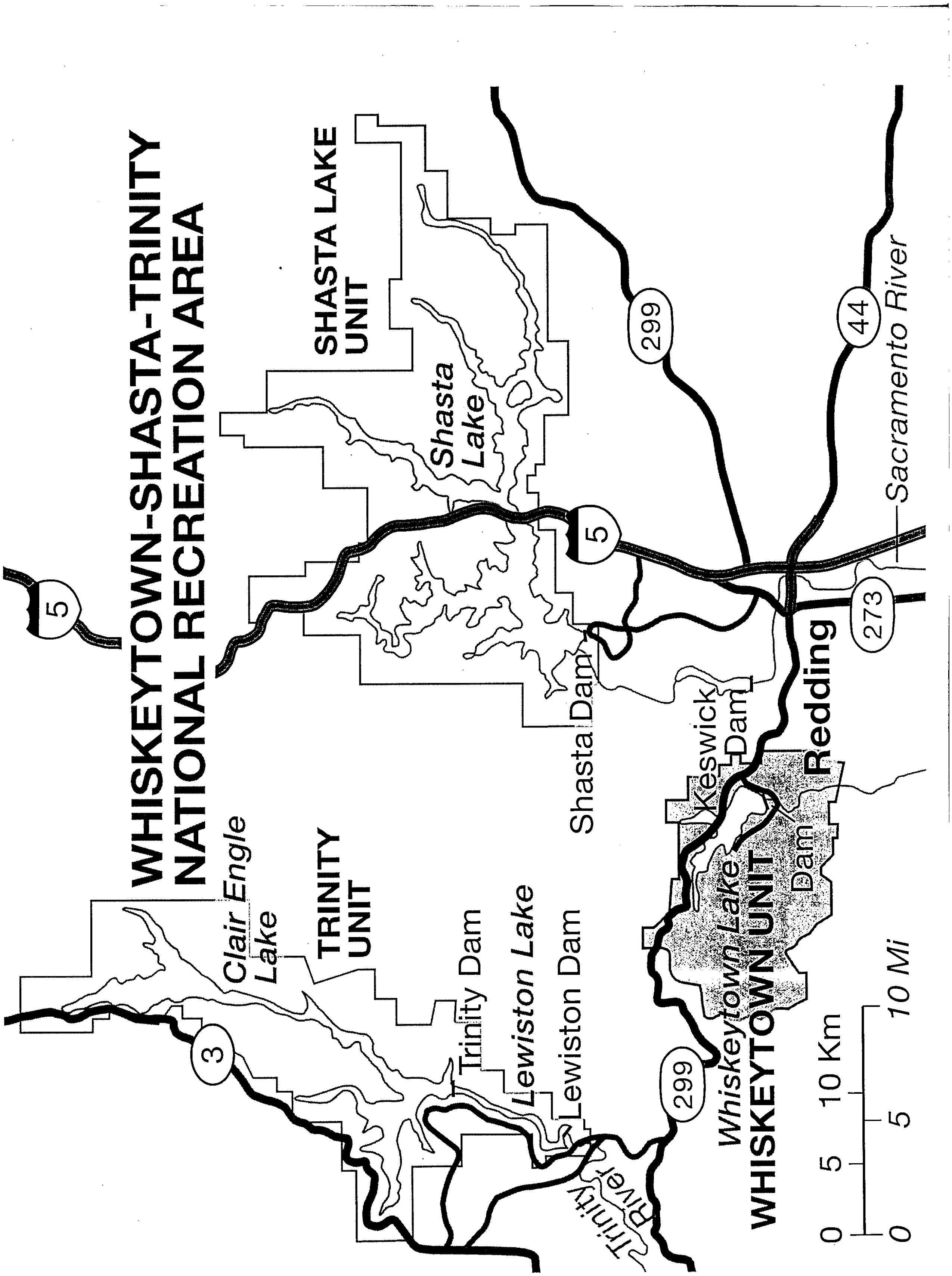


Figure 1: Park Locatio

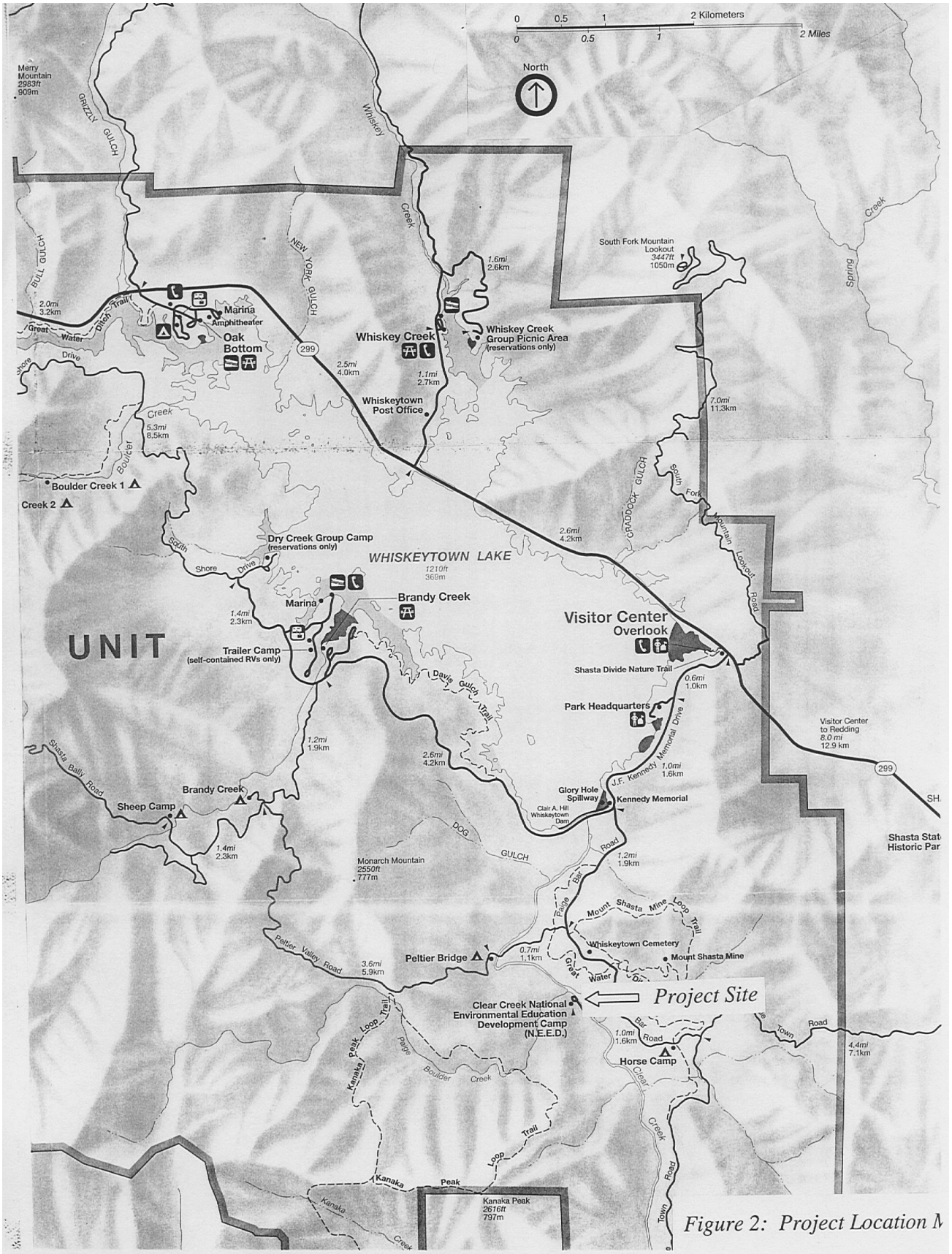


Figure 2: Project Location M

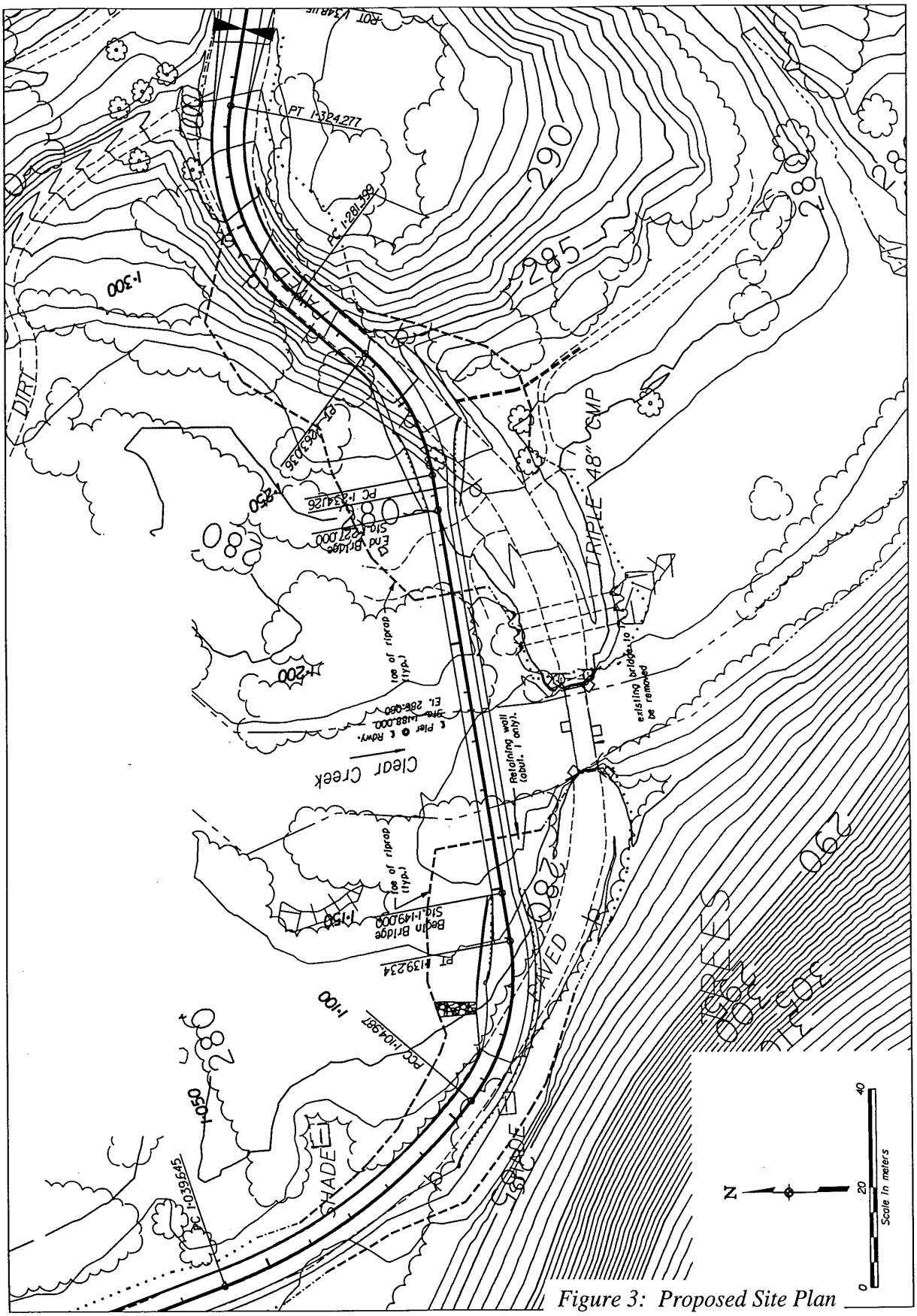


Figure 3: Proposed Site Plan

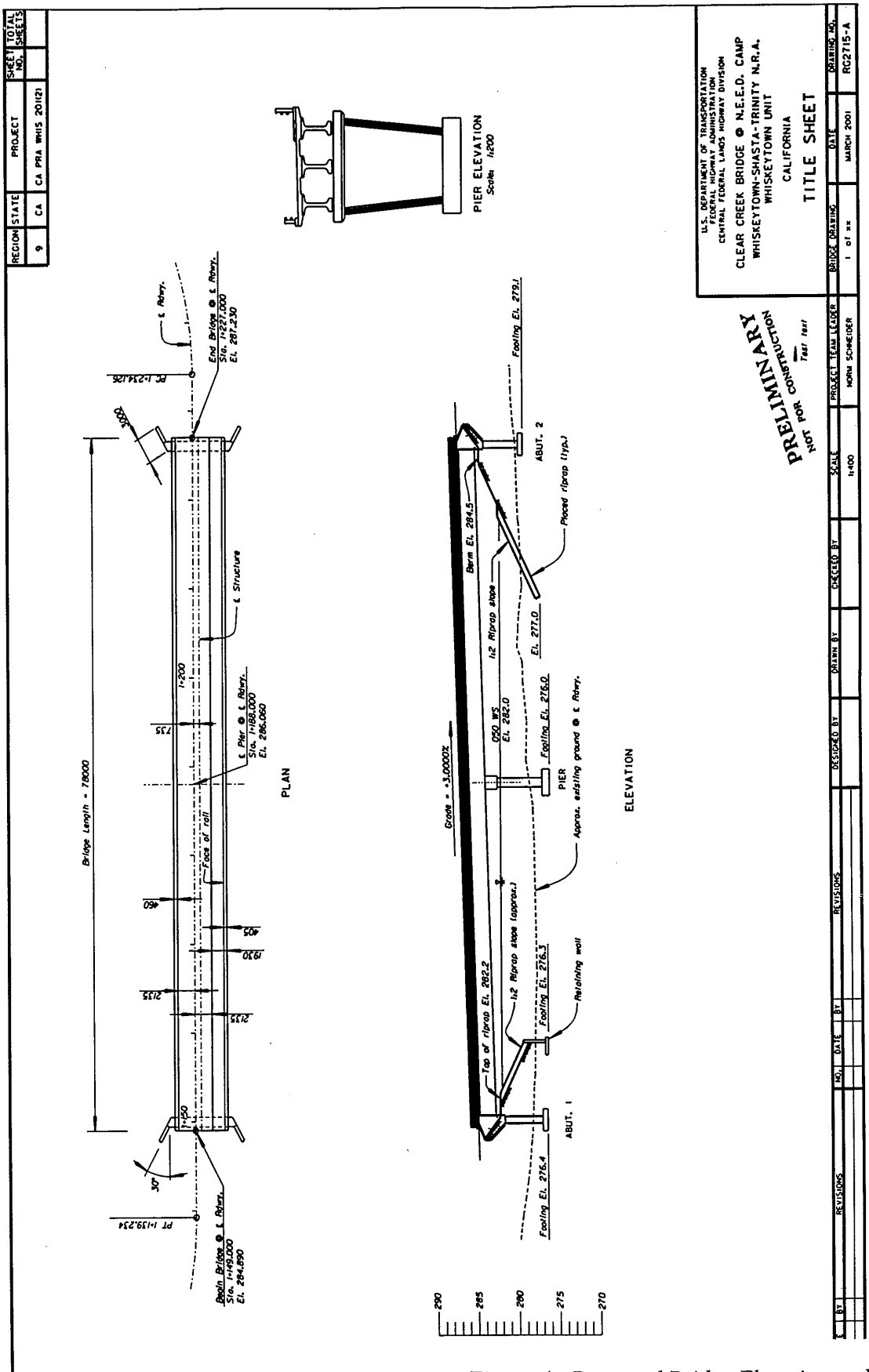


Figure 4: Proposed Bridge Elevation and Sectio

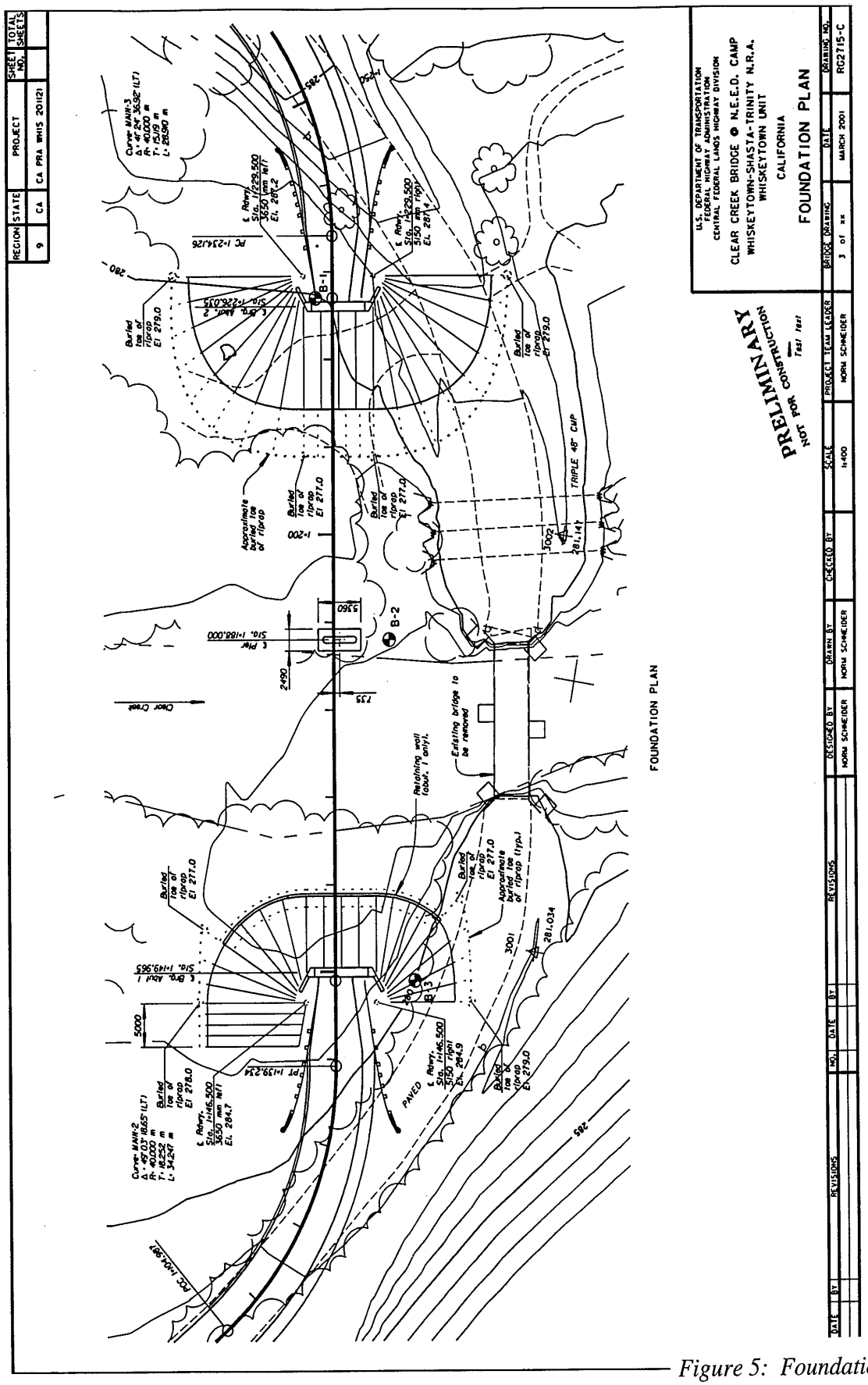
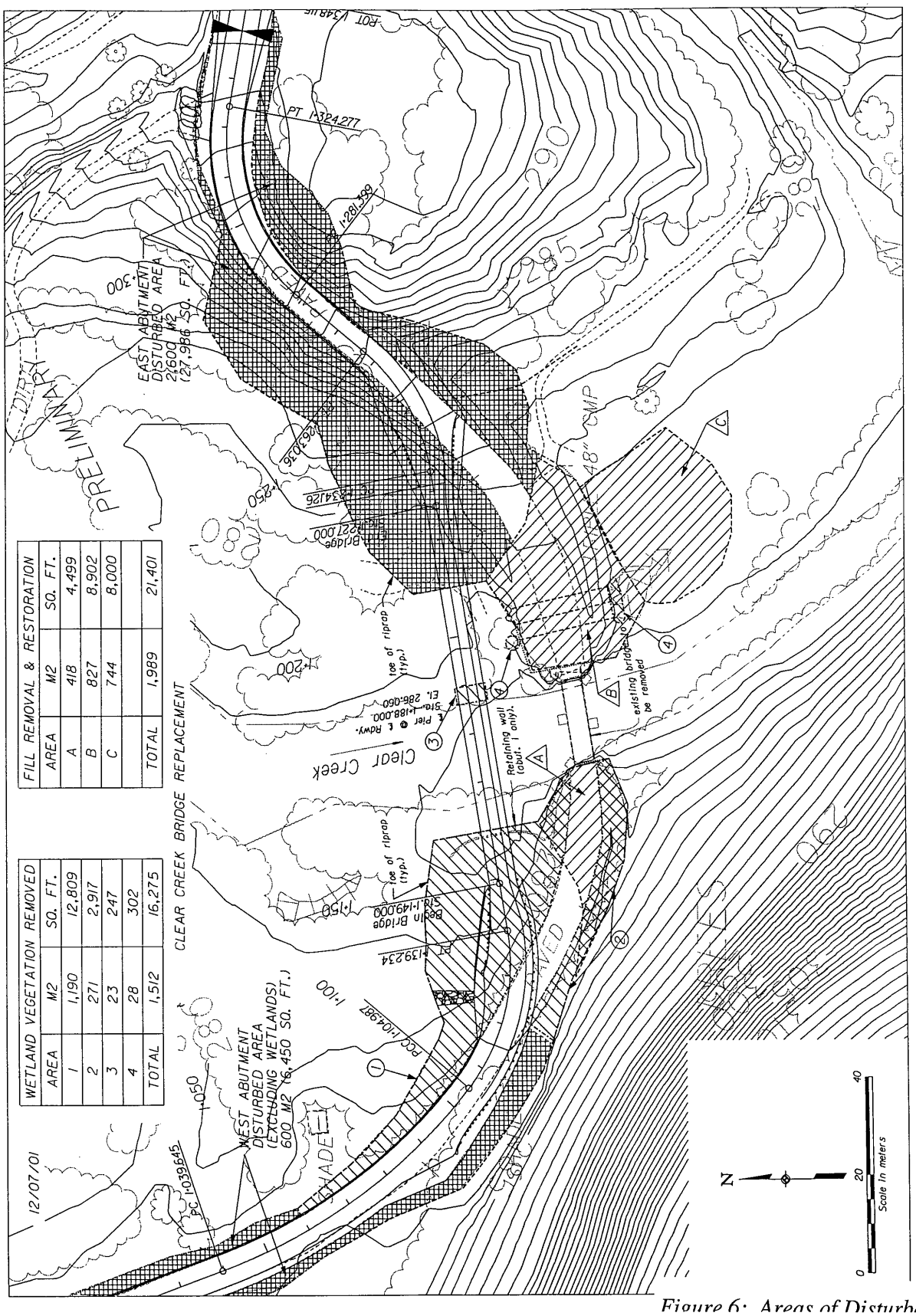


Figure 5: Foundation Pl



WETLAND VEGETATION REMOVED		
AREA	M2	SQ. FT.
1	1,190	12,809
2	271	2,917
3	23	247
4	28	302
TOTAL	1,512	16,275

FILL REMOVAL & RESTORATION		
AREA	M2	SQ. FT.
A	418	4,499
B	827	8,902
C	744	8,000
TOTAL	1,989	21,401

Figure 6: Areas of Disturban